

AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions and listings of claims in this application.

Please cancel claim 4 without prejudice or disclaimer.

Listing of Claims:

1. (Currently Amended) A method of purifying reduced coenzyme Q₁₀ which comprises washing crystals and/or oil of reduced coenzyme Q₁₀ with a solvent composed of at least one of water-soluble organic solvent which is highly miscible with water or a mixed solvent composed of at least one [[a]] water-soluble organic solvent which is highly miscible with water and water to thereby remove a water-soluble impurity from the crystals and/or oil of reduced coenzyme Q₁₀,

wherein the water-soluble organic solvent is selected from the group consisting of alcohols having 1 to 6 carbon atoms, ketones having 3 to 6 carbon atoms, dioxane, tetrahydrofuran, acetonitrile, propionitrile, butyronitrile, isobutyronitrile, formamide, N- methylformamide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methylpyrrolidone, dimethyl sulfoxide, and sulfolane,

the water-soluble impurity is a reducing agent used for converting oxidized coenzyme Q₁₀ into reduced coenzyme Q₁₀ and/or an impurity derived from the reducing agent, the reducing agent being selected from the group consisting of hyposulfurous acid, hyposulfurous acid salts, ascorbic acids, esters of ascorbic acids and salts of ascorbic acids, and the ascorbic acids being selected from the group consisting of ascorbic acid, rhamno-ascorbic acid, arabo-ascorbic acid, gluco-ascorbic acid, fuco-ascorbic acid, glucohepto-ascorbic acid, xylo-ascorbic acid, galacto-ascorbic acid, gulo-ascorbic acid, allo-ascorbic acid, erythro-ascorbic acid and 6-desoxyascorbic acid.

2. (Currently Amended) The method of purifying reduced coenzyme Q₁₀ according to Claim 1,

wherein the washing of the crystals and/or oil of reduced coenzyme Q₁₀ is carried out in a state of dispersion of the crystals and/or oil of reduced coenzyme Q₁₀ in the solvent composed of at least one of water-soluble organic solvent or the mixed solvent composed of the water-soluble organic solvent and water.

3. (Original) The method of purifying reduced coenzyme Q₁₀ according to Claim 2,

wherein the dispersion is caused in a state of forced flowing.

4. (Cancelled)

5. (Currently Amended) The method of purifying reduced coenzyme Q₁₀ according to Claim [[4]] 1,

wherein the water-soluble organic solvent is ethanol.

6. (Currently Amended) The method of purifying reduced coenzyme Q₁₀ according to Claim 1,

wherein the washing is carried out with [[a]] the mixed solvent composed of at least one [[an]] organic solvent and water.

7. (Currently Amended) The method of purifying reduced coenzyme Q₁₀ according to Claim 6,

wherein the washing is carried out with [[a]] the mixed solvent having a water-soluble organic solvent content of not less than 5 w/w%.

8. (Cancelled)

9. (Cancelled)

10. (Previously Presented) The method of purifying reduced coenzyme Q₁₀ according to Claim 1,

wherein the reducing agent is selected from the group consisting of ascorbic acids, esters of ascorbic acids, salts of ascorbic acids, and the ascorbic acids being selected from the group consisting of ascorbic acid, rhamno-ascorbic acid, arabo-ascorbic acid, gluco-ascorbic acid, fuco-ascorbic acid, glucohepto-ascorbic acid, xylo-ascorbic acid, galacto-ascorbic acid, gulo-ascorbic acid, allo-ascorbic acid, crythro-ascorbic acid and 6-desoxyascorbic acid .

11. (Original) The method of purifying reduced coenzyme Q₁₀ according to Claim 10, wherein the impurity derived from ascorbic acid or a related compound thereof is oxalic acid.

12. (Previously Presented) The method of purifying reduced coenzyme Q₁₀ according to Claim [[4]] 1,

wherein the concentration of reduced coenzyme Q₁₀ during washing is not higher than 30 w/w% as expressed in terms of the weight of reduced coenzyme Q₁₀ relative to the weight of the solvent at the time of completion of the washing.

13. (Previously Presented) The method of purifying reduced coenzyme Q₁₀ according to Claim 1,

wherein reduced coenzyme Q₁₀ occurs as a form of crystals.

14. (Original) The method of purifying reduced coenzyme Q₁₀ according to Claim 13, wherein the washing temperature is not higher than 50°C.

15. (Previously Presented) The method of purifying reduced coenzyme Q₁₀ according to Claim 1,

wherein reduced coenzyme Q₁₀ occurs as a form of oil and the washing temperature is not lower than the melting temperature of reduced coenzyme Q₁₀.

16. (Original) The method of purifying reduced coenzyme Q₁₀ according to Claim 15, wherein the washing temperature is not lower than 40°C.

17. (Previously Presented) The method of purifying reduced coenzyme Q₁₀ according to Claim 15,

wherein crystals of reduced coenzyme Q₁₀ is recovered by cooling the solution obtainable after impurity removal from the oil of reduced coenzyme Q₁₀.

18. (Previously Presented) The method of purifying reduced coenzyme Q₁₀ according to Claim 15,

wherein crystals of reduced coenzyme Q₁₀ is recovered by contacting seed crystals to oil of reduced coenzyme Q₁₀ obtainable after impurity removal from said oil.

19. (Previously Presented) The method of purifying reduced coenzyme Q₁₀ according to Claim 1,

wherein reduced coenzyme Q₁₀ is purified in a deoxygenated atmosphere.

20. (Currently Amended) A process of purifying reduced coenzyme Q₁₀ comprising:

washing one or more of crystals of reduced coenzyme Q₁₀ and oil of reduced Q₁₀ with a solvent composed of at least one water-soluble organic solvent which is highly miscible with water or a mixed solvent composed of at least one [[a]] water-soluble organic solvent which is highly miscible with water and water;

removing a water-soluble impurity from the crystals and/or the oil into the solvent composed of at least one water-soluble organic solvent or the mixed solvent composed of [[a]] at least one water-soluble organic solvent and water; and completing the purifying process without using a chromatographic purification step,

wherein the water-soluble organic solvent is selected from the group consisting of alcohols having 1 to 6 carbon atoms, ketones having 3 to 6 carbon atoms, dioxane, tetrahydrofuran, acetonitrile, propionitrile, butyronitrile, isobutyronitrile, formamide, N-

methylformamide, N,N-dimethylformamide, N,N-dimethylacetoamide, N-methylpyrrolidone, dimethyl sulfoxide, and sulfolane,

the water-soluble impurity is a reducing agent used for converting oxidized coenzyme Q₁₀ into reduced coenzyme Q₁₀ and/or an impurity derived from the reducing agent, the reducing agent being selected from the group consisting of hyposulfurous acid, hyposulfurous acid salts, ascorbic acids, esters of ascorbic acids and salts of ascorbic acids, and the ascorbic acids being selected from the group consisting of ascorbic acid, rhamno-ascorbic acid, arabo-ascorbic acid, gluco-ascorbic acid, fuco-ascorbic acid, glucohepto-ascorbic acid, xylo-ascorbic acid, galacto-ascorbic acid, gulo-ascorbic acid, allo-ascorbic acid, erythro-ascorbic acid and 6-desoxyascorbic acid.

21. (Previously Presented) The method of purifying reduced coenzyme Q₁₀ according to Claim 1,

wherein a conversion of oxidized coenzyme Q₁₀ into reduced coenzyme Q₁₀ is carried out using an organic solvent highly miscible with water.